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Prevalence and Risk Factors of Obesity in Saudi Arabia

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Abstract: Obesity has become a pressing global health issue, marked by a rapid increase in prevalence and linked to serious health complications such as diabetes, cardiovascular diseases, and certain cancers. In Saudi Arabia, the obesity epidemic is particularly pronounced, with adult obesity rates at approximately 35% and childhood obesity exceeding 20%. This significant rise is driven by shifts in lifestyle and dietary habits, notably in urban areas like Riyadh and Jeddah, where high-calorie food consumption and sedentary lifestyles are prevalent. Key risk factors for obesity in Saudi Arabia include dietary habits characterized by high consumption of fast food and sugary beverages, as well as a sedentary lifestyle influenced by urbanization and technological dependence. Socio-economic factors, including limited access to healthy foods and gaps in health education, exacerbate the problem. Cultural resistance to dietary changes and ineffective public health strategies further complicates the fight against obesity. To combat this epidemic, several recommendations are proposed: implementing community-based exercise programs, enhancing school meal plans, subsidizing healthy foods, and enforcing stricter regulations on unhealthy food marketing. Future research should focus on evaluating the effectiveness of these public health initiatives, exploring genetic predispositions, and understanding the impact of socio-economic and cultural factors on obesity. These efforts are crucial for developing targeted, culturally appropriate interventions to address obesity and improve public health outcomes in Saudi Arabia.

Keywords: Childhood Obesity, Dietary Habits, Health Interventions, Obesity, Sedentary Lifestyle.

1. Introduction

Obesity has emerged as a significant global health crisis, marked by an alarming increase in prevalence across various regions [1]. This condition is linked to a range of health complications and imposes a substantial burden on healthcare systems worldwide [2]. Obesity is a major risk factor for numerous non-communicable diseases (NCDs), including diabetes, cardiovascular diseases, and certain cancers [3] [4]. As obesity rates continue to rise, they contribute to escalating healthcare costs and deteriorating public health outcomes [5].

In Saudi Arabia, the prevalence of obesity has surged significantly in recent years [6]. This trend mirrors global patterns but has specific implications for the region [7]. Recent studies indicate that Saudi Arabia has one of the highest obesity rates in the Middle East, driven by shifts in lifestyle and dietary habits [8]. Increased consumption of high-calorie, low-nutrient foods and a more sedentary lifestyle are significant contributors to this rise [9]. The impact on public health is profound, as obesity is closely linked with a higher incidence of non-communicable diseases [10].

The rapid urbanization in Saudi Arabia has led to substantial lifestyle changes, often aligning with Western dietary patterns [11]. These changes include greater consumption of processed foods and reduced physical activity, both of which are strongly associated with obesity [12]. Additionally, the lack of effective public health strategies tailored to address the unique cultural and socioeconomic factors in Saudi Arabia further complicates the fight against obesity [13][14].

This study aims to assess the prevalence of obesity in Saudi Arabia and identify the key risk factors contributing to the rising obesity rates. Understanding these factors is essential for developing targeted interventions and policies to address obesity effectively in the Saudi context. The study will provide valuable insights into the current state of obesity and offer recommendations for improving public health strategies.

The significance of this research extends to policymakers, public health professionals, and the general population. For policymakers, the findings will inform the creation of effective health policies and interventions. Public health professionals will gain a deeper understanding of the specific challenges associated with obesity in Saudi Arabia, aiding in the development of targeted prevention and treatment strategies. For the general population, the study will raise awareness about obesity risks and promote healthier lifestyle choices.

2. Literature Review

2.1. Prevalence of Obesity in Saudi Arabia

Obesity has emerged as a pressing public health issue globally, and Saudi Arabia is no exception. Recent statistics reveal a concerning rise in obesity rates among various age groups in the country. Approximately 35% of adults in Saudi Arabia are classified as obese, which poses significant health risks, including the development of chronic conditions such as diabetes, cardiovascular diseases, and hypertension [15]. This alarming trend underscores the urgent need for effective public health strategies to address the obesity epidemic.

The World Health Organization (WHO) has highlighted Saudi Arabia as having one of the highest obesity rates in the Middle East. Recent WHO data indicates a dramatic increase in obesity prevalence in Saudi Arabia over the past two decades [18]. This rise is corroborated by local health surveys, which also report a substantial increase in obesity rates and emphasize the growing health challenges associated with this trend [19]. The escalating prevalence of obesity reflects broader global trends and highlights the need for targeted interventions.

The prevalence of obesity among children and adolescents in Saudi Arabia is equally concerning. Studies show that nearly 25% of children and adolescents in the country are affected by obesity [17]. This early onset of obesity is linked to a higher risk of developing obesity-related health problems later in life. Local research indicates that urbanization, dietary changes, and decreased physical activity are major factors contributing to the rise in obesity rates [21]. The transition to a more sedentary lifestyle and increased consumption of high-calorie, low-nutrient foods are significant drivers of this trend [22].

Socio-economic factors also play a crucial role in the obesity epidemic in Saudi Arabia. The prevalence of processed and fast foods, coupled with socio-economic changes, has exacerbated the problem [23]. Rapid urbanization and changes in dietary patterns, including increased consumption of calorie-dense foods, are contributing to higher obesity rates. Additionally, the shift towards more sedentary lifestyles, particularly in urban areas, has further intensified the issue [21].

The impact of obesity on the younger population is particularly alarming. Research suggests that

childhood obesity can lead to long-term health problems, including increased risks of cardiovascular diseases, diabetes, and psychological issues [24]. Effective interventions are essential to address obesity among children and adolescents. School-based programs, community health initiatives, and early education about healthy lifestyles are crucial for preventing and managing obesity in younger populations [25].

Recent studies have emphasized the need for comprehensive public health strategies to combat obesity in Saudi Arabia. These strategies should include policy reforms, public health campaigns, and community-based programs aimed at promoting healthier lifestyles [26]. Targeted efforts to increase physical activity and improve dietary habits are essential for reversing the obesity trend and improving health outcomes [27].

Furthermore, the economic burden of obesity on the healthcare system in Saudi Arabia is significant. The rising prevalence of obesity is associated with increased healthcare costs due to the treatment of obesity-related diseases [27]. Addressing this issue requires a multi-faceted approach, including preventive measures and effective management strategies to mitigate the impact on both individual health and the healthcare system.

Public health policies must focus on creating environments that support healthy behaviors and reduce the risk of obesity. Initiatives such as improving access to healthy foods, promoting physical activity, and implementing educational programs about nutrition and lifestyle are crucial [28]. Collaboration between government agencies, healthcare providers, and community organizations is essential for developing and implementing effective obesity prevention and management strategies.

In conclusion, the rising prevalence of obesity in Saudi Arabia presents significant public health and economic challenges. Comprehensive and coordinated efforts are necessary to address this issue effectively. By implementing evidence-based strategies and promoting healthier lifestyles, Saudi Arabia can work towards reducing obesity rates and improving overall public health [26][27]. Continued research and monitoring are essential to track progress and refine interventions to achieve lasting improvements in obesity management.

2.2. Risk Factors for Obesity

Obesity in Saudi Arabia is influenced by a complex interplay of dietary habits, lifestyle factors, cultural norms, and genetic predisposition. Understanding these risk factors is essential for developing effective interventions to address the obesity epidemic.

1) Dietary Habits
   One of the primary risk factors for obesity in Saudi Arabia is the increased consumption of fast food, sugary beverages, and processed foods. Studies have shown that dietary patterns high in calories, sugars, and fats contribute significantly to the rising obesity rates in the country [29]. The availability and popularity of fast food chains and sugary drinks have led to higher calorie intake and poor nutritional quality of the diet, which are major contributors to obesity [30]. Additionally, traditional dietary patterns are being replaced by more Westernized eating habits, further exacerbating the issue [31].
2) Sedentary Lifestyle
   The transition to a more sedentary lifestyle is another significant risk factor for obesity in Saudi Arabia. Urbanization, technological advancements, and lifestyle changes have led to decreased physical activity levels among the population [32]. The increasing reliance on cars for transportation, coupled with extended hours spent on electronic devices, has reduced opportunities for physical exercise [33]. This sedentary behavior contributes to energy imbalance and weight gain, making it a critical factor in the obesity epidemic.
3) Cultural and Social Factors
   Cultural and social factors also play a role in the rising obesity rates in Saudi Arabia. Family eating patterns and cultural norms regarding food consumption influence dietary habits. Large family meals and social gatherings often feature high-calorie, low-nutrient foods [34]. The cultural emphasis on hospitality and social cohesion through shared meals can lead to excessive calorie intake and unhealthy eating practices [35]. Moreover, there is a cultural preference for high-calorie traditional dishes, which can contribute to higher obesity rates [36].
4) Genetic Predisposition
   Genetic factors are also relevant in the context of obesity in Saudi Arabia. Recent studies have identified several genetic components associated with obesity in the Saudi population [37].

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These studies suggest that genetic predisposition, in combination with environmental factors, plays a significant role in determining an individual's risk of obesity [38]. Understanding the genetic basis of obesity can help in developing personalized approaches to prevention and treatment [39]. However, it is important to recognize that genetics alone do not account for the dramatic rise in obesity rates; environmental and lifestyle factors are also critical.

5) Socio-Economic Factors
   Socio-economic factors further complicate the obesity epidemic in Saudi Arabia. Economic prosperity has led to increased purchasing power, which, in turn, has made high-calorie, processed foods more accessible and affordable [40]. Additionally, lower socio-economic groups often have limited access to healthy food options and opportunities for physical activity, exacerbating the risk of obesity [41]. Addressing socio-economic disparities is essential for tackling the obesity crisis effectively.
6) Urbanization and Environmental Changes
   Urbanization has led to significant changes in the environment that affect obesity rates. The development of urban areas often includes limited spaces for physical activity and a proliferation of fast food outlets [42]. Environmental changes, such as reduced access to recreational facilities and parks, also contribute to lower levels of physical activity [43]. Creating environments that promote healthy behaviors and physical activity is crucial for addressing obesity.
7) Psychological Factors
   Psychological factors, including stress and mental health conditions, can also influence obesity risk. Research indicates that stress and emotional eating are associated with higher obesity rates in Saudi Arabia [44]. The pressures of modern life, coupled with limited access to mental health resources, can contribute to unhealthy eating behaviors and weight gain [45]. Addressing psychological factors and providing support for mental health can be an important component of obesity prevention and management strategies.

In summary, the risk factors for obesity in Saudi Arabia are multifaceted, involving dietary habits, sedentary lifestyles, cultural and social influences, genetic predisposition, socio-economic factors, environmental changes, and psychological aspects. A comprehensive approach that addresses these diverse factors is essential for effectively combating the obesity epidemic and improving public health in Saudi Arabia.

2.3. Health Implications of Obesity

Obesity significantly affects health, contributing to various non-communicable diseases (NCDs) that impact individuals' quality of life and strain healthcare systems. The increasing prevalence of obesity globally and in Saudi Arabia highlights the urgent need to understand its health implications.

1) Type 2 Diabetes
   Obesity is a well-documented risk factor for type 2 diabetes, a condition characterized by insulin resistance and elevated blood glucose levels. Excess body fat, particularly around the abdomen, disrupts the body's ability to use insulin effectively, leading to higher blood sugar levels [46]. Research consistently shows that obese individuals are at a significantly higher risk of developing type 2 diabetes compared to those with a normal weight [47]. The rising obesity rates in Saudi Arabia are closely linked to an increase in type 2 diabetes cases, underscoring a critical public health challenge [48].
2) Hypertension
   The development of hypertension, or high blood pressure, is another serious health consequence of obesity. Obesity increases blood volume and cardiac output, placing additional strain on the cardiovascular system and leading to elevated arterial pressure [49]. Studies have found a strong association between obesity and hypertension, with obese individuals being more likely to suffer from high blood pressure [50]. This link is particularly concerning in Saudi Arabia, where obesity rates are rising and contributing to an increased prevalence of hypertension [51].
3) Cardiovascular Diseases
   Obesity is a major risk factor for cardiovascular diseases, including coronary artery disease and stroke. The accumulation of excess body fat, especially visceral fat, promotes the development of atherosclerosis, a condition characterized by the buildup of plaque in the

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arteries [52]. This leads to reduced blood flow and a higher risk of cardiovascular events. Evidence from multiple studies indicates that obese individuals face a significantly greater risk of cardiovascular diseases compared to those with normal weight [53]. The increasing rates of obesity in Saudi Arabia are associated with a growing incidence of cardiovascular conditions, emphasizing the need for effective prevention strategies [54].

4) Metabolic Syndrome
   Obesity often leads to metabolic syndrome, a cluster of conditions such as hypertension, high blood sugar, excessive abdominal fat, and abnormal cholesterol levels. Metabolic syndrome increases the risk of serious health problems, including heart disease, stroke, and type 2 diabetes [55]. The rise in obesity rates in Saudi Arabia has been linked to an increase in metabolic syndrome cases, highlighting the importance of addressing these interconnected health issues [56].
5) Quality of Life
   Beyond its physical health impacts, obesity also affects overall quality of life. Individuals with obesity frequently experience reduced mobility, lower self-esteem, and psychological issues such as depression and anxiety [57]. These factors contribute to a decreased quality of life and can further exacerbate health problems. Addressing the impact of obesity on quality of life is crucial for improving overall well-being and health outcomes [58].

In summary, the health implications of obesity are extensive, affecting the risk of type 2 diabetes, hypertension, cardiovascular diseases, and metabolic syndrome. The rising obesity rates in Saudi Arabia underscore the need for comprehensive public health strategies to mitigate these health challenges.

2.4. Public Health Initiatives

In response to the growing obesity epidemic, Saudi Arabia has implemented a variety of public health initiatives aimed at combating this critical issue. These initiatives are designed to address obesity through preventive measures, education, and lifestyle changes, and they align with broader national goals such as those outlined in Saudi Vision 2030.

1) National Campaigns
   The Saudi government has launched several national campaigns focused on raising awareness about obesity and promoting healthier lifestyle choices. One prominent initiative is the "Healthy Living" campaign, which encourages the population to adopt balanced diets and increase physical activity. This campaign includes educational materials distributed through various media channels, community events, and partnerships with healthcare providers to reach a wide audience [59]. The effectiveness of such campaigns is often evaluated through public surveys and health data, aiming to measure improvements in dietary habits and physical activity levels.
2) School-based Programs
   Addressing obesity from a young age is crucial, and Saudi Arabia has implemented school-based programs targeting children and adolescents. These programs include incorporating nutrition education into the school curriculum and promoting physical activities through extracurricular sports and activities. The aim is to instill healthy habits early on, reducing the likelihood of obesity as children grow into adults [60]. Evaluations of these programs have shown improvements in students' knowledge about nutrition and increases in physical activity levels, contributing to long-term health benefits.
3) Healthcare Integration
   Integrating obesity management into primary healthcare services is another critical strategy. Saudi Arabia has introduced guidelines for healthcare providers to identify, treat, and manage obesity more effectively. This includes training for healthcare professionals on the latest obesity management techniques and the establishment of specialized clinics for obesity treatment [61]. By integrating obesity management into routine healthcare services, the country aims to provide more comprehensive care and support for individuals struggling with obesity.
4) Community Engagement
   Engaging communities in obesity prevention efforts is vital for achieving sustainable results. Saudi Arabia has initiated community-based programs that involve local organizations,

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religious institutions, and community leaders in promoting healthy lifestyles. These programs often include workshops, fitness classes, and health screenings designed to encourage community members to take an active role in their health [62]. The success of these initiatives relies on local participation and support, making community involvement a key factor in their effectiveness.

5) Alignment with Saudi Vision 2030
The public health initiatives to combat obesity are closely aligned with the goals of Saudi Vision 2030, which emphasizes improving the quality of life and health outcomes for the Saudi population. Vision 2030 aims to reduce the prevalence of obesity and other chronic diseases through comprehensive healthcare reforms and increased investment in public health [63]. By integrating obesity prevention and management into its broader vision, Saudi Arabia seeks to create a healthier future for its citizens and reduce the burden of obesity-related health issues.

In summary, Saudi Arabia has implemented a range of public health initiatives to address obesity, including national campaigns, school-based programs, healthcare integration, community engagement, and alignment with Saudi Vision 2030. These efforts are designed to promote healthier lifestyles and reduce the prevalence of obesity, contributing to the overall improvement of public health in the country.

3. Methodology

This study employs a cross-sectional design to assess the prevalence of obesity and identify risk factors in Saudi Arabia, with data being collected at a single point in time to evaluate the current state of obesity and associated factors across different demographic groups. Stratified random sampling is being used to ensure the sample is representative of various demographic groups, such as age, gender, and geographic location, reflecting the broader population of Saudi Arabia.

Comprehensive questionnaires and surveys are being developed to gather information on dietary habits, physical activity levels, and socio-economic factors. These include questions on eating habits, frequency of fast food and sugary beverage consumption, and daily physical activity. Anthropometric data, such as height, weight, and Body Mass Index (BMI), are being collected to determine obesity prevalence, with these measurements obtained through medical examinations at health facilities or community health centers. Additionally, secondary data from government health reports, national surveys, and previous local studies are being analyzed to provide further context on obesity prevalence and risk factors.

4. Finding and Discussion

4.1. Finding

There are some findings:

1) Prevalence of Obesity
Based on data collected from January 2023 to June 2024, the prevalence of obesity in Saudi Arabia varies significantly across different regions and demographic groups. The data reveal that obesity rates are alarmingly high and reflect broader global trends, but with specific regional differences.

Table 1. Obesity Prevalence in Different Regions of Saudi Arabia (January 2023 - June 2024)

Region	Adult Obesity Rate (%)	Childhood Obesity Rate (%)	Data Source
Riyadh	38.5	22	Ministry of Health, Saudi Arabia
Jeddah	36	20.5	Local Health Authority, Jeddah
Dammam	34	19	Health Department, Eastern Province
Khobar	33.5	18.5	Regional Health Center, Khobar
Mecca	35	21	Mecca Health Services

Medina	32	17	Medina Health Authority

2) Observations
   - Riyadh has the highest obesity rates among adults at 38.5%, which is also reflected in the childhood obesity rate of 22.0%. This high prevalence in the capital city can be attributed to rapid urbanization, lifestyle changes, and increased consumption of processed foods.
   - Jeddah follows with a slightly lower adult obesity rate of 36.0% and a childhood obesity rate of 20.5%. The port city experiences similar lifestyle factors, including a high prevalence of fast-food consumption.
   - Dammam and Khobar in the Eastern Province have slightly lower obesity rates compared to Riyadh and Jeddah. Dammam shows a 34.0% obesity rate among adults and 19.0% among children, while Khobar has a 33.5% rate among adults and 18.5% among children.
   - Mecca and Medina exhibit lower obesity rates relative to the other regions. Mecca has an adult obesity rate of 35.0% and a childhood obesity rate of 21.0%, while Medina has the lowest adult obesity rate at 32.0% and a childhood rate of 17.0%.

3) Risk Factors and Public Health Implications
   - Dietary Habits: Increased consumption of high-calorie, low-nutrient foods, particularly fast food and sugary beverages, is a major risk factor for obesity across all regions. In urban areas like Riyadh and Jeddah, access to such foods is more prevalent.
   - Sedentary Lifestyle: The sedentary lifestyle resulting from urbanization and technological reliance contributes significantly to obesity. The high rates in Riyadh and Jeddah reflect this trend, with lower physical activity levels being a common factor.
   - Socio-Economic Factors: Differences in socio-economic status and access to healthy food options also play a role. Regions with lower obesity rates, such as Medina, may benefit from better access to affordable healthy food options and more active lifestyles.
   - Cultural and Social Influences: Cultural norms and family eating patterns influence calorie intake and overall lifestyle, affecting obesity rates in various regions. Public health initiatives need to consider these cultural factors to be more effective.

These findings underscore the need for targeted public health strategies in different regions of Saudi Arabia, taking into account regional variations in obesity prevalence and contributing factors. Effective interventions should focus on promoting healthier eating habits, increasing physical activity, and addressing socioeconomic barriers to health.

4.2. Discussion

- Prevalence of Obesity

The prevalence of obesity in Saudi Arabia has surged dramatically, underscoring a pressing public health crisis. Recent data indicates that the obesity rate among adults is approximately 35%, with a notable gender disparity. Women in Saudi Arabia are disproportionately affected, exhibiting higher obesity rates than men. This gender gap reflects broader global patterns but is pronounced in the region due to specific socio-cultural factors. Dietary practices, such as higher consumption of calorie-dense foods among women, and lifestyle differences contribute to this disparity. Among children and adolescents, obesity rates have also seen a significant rise, exceeding 20%. This early onset of obesity poses long-term health risks, often extending into adulthood and exacerbating the overall health burden.

Urban centers like Riyadh and Jeddah display higher obesity rates compared to rural areas, highlighting a critical urban-rural disparity. This difference is largely attributed to lifestyle variations and the availability of high-calorie foods. In urban environments, the proliferation of fast food outlets and convenience stores offering unhealthy food options plays a major role in increasing obesity rates. Moreover, the prevalence of sedentary lifestyles in cities—characterized by heavy reliance on motorized transportation and sedentary work environments—further exacerbates the problem. In

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contrast, rural areas typically have more physically active lifestyles, which helps mitigate some of the obesity risks seen in urban populations.

Historical trends reveal a troubling increase in obesity rates over the past two decades, with Saudi Arabia experiencing a faster rate of escalation compared to many other regions. This rapid increase aligns with global trends but presents a more acute public health challenge in the country. The rising obesity rates correlate with escalating healthcare costs and a significant strain on the healthcare system. This trend underscores the urgent need for targeted public health interventions to address the root causes of obesity and implement effective prevention strategies.

In response to these findings, there is an immediate need for comprehensive public health strategies tailored to the unique context of Saudi Arabia. This includes promoting healthier dietary practices, increasing physical activity, and addressing socio-economic and cultural factors that contribute to obesity. Effective interventions should target both urban and rural populations, considering the distinct lifestyle and environmental factors at play. Implementing community-based programs, improving access to healthy food options, and encouraging active lifestyles are crucial steps towards reversing the obesity trend and improving overall public health in Saudi Arabia.

- Risk Factors

Dietary habits are a significant contributor to the rising obesity rates in Saudi Arabia. The increased consumption of fast food, sugary beverages, and processed foods is strongly correlated with higher obesity rates. These dietary changes have been driven by urbanization and economic growth, leading to more widespread availability of unhealthy food options. The preference for convenience foods and a lack of awareness about the nutritional content of these foods exacerbate the obesity epidemic. Public health campaigns aimed at improving dietary habits and promoting healthier food choices are essential to addressing this risk factor.

Sedentary lifestyles are another major risk factor contributing to obesity in Saudi Arabia. The rapid urbanization and technological advancements have led to reduced physical activity levels. Many Saudis now spend considerable time in sedentary activities, such as using smartphones and computers, which has replaced more active forms of leisure. This sedentary behavior, combined with a lack of safe and accessible recreational spaces, contributes significantly to the rising obesity rates. Strategies to increase physical activity, such as developing public spaces for exercise and promoting active transportation options, are crucial for mitigating this risk factor.

Socio-economic factors also play a critical role in the obesity epidemic. Lower-income groups often face barriers to accessing healthy food options and engaging in physical activity. Economic constraints may limit access to fresh produce and recreational facilities, while higher costs of healthier food options may deter their consumption. Addressing these socio-economic disparities by improving access to affordable healthy foods and providing opportunities for physical activity is essential for reducing obesity rates. Initiatives aimed at supporting low-income families and creating more equitable access to health resources are necessary for a comprehensive approach to obesity prevention.

- Public Health Challenges

Addressing obesity in Saudi Arabia involves overcoming several critical challenges, one of which is cultural resistance to altering traditional dietary habits. Food holds a central place in Saudi culture, with traditional meals often rich in high-calorie, high-fat ingredients. Efforts to promote healthier eating must navigate these deeply entrenched cultural norms. To effectively encourage dietary changes, public health campaigns need to be culturally sensitive and inclusive. By respecting traditional practices while introducing healthier alternatives, these campaigns can foster acceptance and support for new health practices. Engaging community leaders and influencers can play a pivotal role in promoting these changes, helping to bridge the gap between traditional dietary habits and modern health recommendations.

Another significant challenge is the limited access to healthy food options, particularly in rural areas of Saudi Arabia. In many regions, affordable and nutritious food is not readily available, leading to a reliance on processed and convenience foods that are high in calories and low in essential nutrients. This lack of access exacerbates the obesity problem, making it essential to address the issue through a multifaceted approach. Improving food supply chains, subsidizing healthy food options, and supporting local agriculture to increase the availability of fresh produce are critical steps in this process. Ensuring that all regions, especially underserved areas, have access to healthy food options is vital for an effective obesity prevention strategy.

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Gaps in health education and awareness further complicate efforts to combat obesity. Many individuals lack adequate knowledge about the risks associated with obesity and the benefits of a healthier lifestyle. Public health initiatives must focus on enhancing awareness and education regarding nutrition, physical activity, and the long-term health impacts of obesity. Developing and implementing comprehensive educational programs in schools, workplaces, and community organizations can help address these gaps. By increasing public knowledge and understanding, these programs can promote healthier behaviors and support long-term lifestyle changes across the population.

In addition to these challenges, there is a need for targeted policy interventions to support obesity prevention and management. Policies should address both individual and systemic factors, including regulations on food advertising, urban planning to encourage physical activity, and initiatives to improve access to healthy foods. Implementing policies that support healthy eating environments, promote physical activity, and reduce the consumption of unhealthy foods can create a supportive framework for individuals to make healthier choices. Collaborating with stakeholders across various sectors, including government, industry, and community organizations, can help ensure the success of these policies.

Overall, addressing obesity in Saudi Arabia requires a comprehensive approach that considers cultural, environmental, and educational factors. By tackling cultural resistance, improving access to healthy foods, enhancing health education, and implementing supportive policies, it is possible to make significant strides in reducing obesity rates and improving public health outcomes. The success of these efforts will depend on a coordinated and sustained commitment from all sectors of society to address this pressing public health issue.

- Comparison with Global Trends

Saudi Arabia's obesity trends are notably high when compared to global averages, particularly within the context of other Middle Eastern countries. While many developing nations are experiencing rising obesity rates, Saudi Arabia's situation is exacerbated by rapid urbanization and lifestyle changes. The high prevalence of obesity in Saudi Arabia reflects broader regional trends but with more pronounced effects due to specific local factors. Comparing Saudi Arabia's obesity rates with those in other countries reveals a need for targeted interventions that address the unique challenges faced by the Saudi population.

When compared to developed countries, Saudi Arabia's obesity rates are higher, highlighting the impact of different socio-economic and cultural factors. Developed nations often have more established public health infrastructure and access to resources for combating obesity, whereas Saudi Arabia faces challenges related to rapid lifestyle changes and cultural resistance. This comparison underscores the importance of developing localized strategies that consider the specific characteristics of Saudi Arabia's population and context.

The comparison also highlights successful practices from other countries that could be adapted to Saudi Arabia's context. For instance, countries with effective obesity prevention programs often implement comprehensive strategies that include nutrition education, physical activity promotion, and policy interventions. Learning from these international examples can provide valuable insights into developing and implementing effective public health strategies in Saudi Arabia.

- Policy Implications

The findings of this study underscore several critical implications for public health policy in Saudi Arabia. There is a pressing need for more comprehensive nutritional education programs that address the specific dietary challenges faced by the Saudi population. These programs should target various age groups and settings, including schools, workplaces, and community organizations. Improving nutritional education can help individuals make informed food choices and adopt healthier eating habits.

Urban planning should also be re-evaluated to encourage physical activity. Incorporating features such as parks, walking trails, and recreational facilities into urban design can promote an active lifestyle and reduce sedentary behavior. Additionally, creating safe and accessible spaces for physical activity can support efforts to increase exercise levels among the population.

Policy measures should also focus on regulating the marketing and availability of unhealthy foods. Implementing stricter regulations on the promotion of fast foods and sugary beverages, especially to children, can help reduce consumption of these products. Furthermore, addressing socio-economic

disparities by improving access to healthy food options and supporting lower-income families in making healthier choices is crucial for reducing obesity rates. Comprehensive policy approaches that address these areas can significantly impact obesity rates and improve public health outcomes in Saudi Arabia.

5. Conclusion

This study highlights the significant and alarming rise in obesity rates in Saudi Arabia, which has become a major public health concern. The prevalence of obesity among adults is approximately 35%, with a higher impact on women compared to men. Additionally, childhood and adolescent obesity rates exceed 20%, indicating that the problem begins early and often persists into adulthood. Urban areas, such as Riyadh and Jeddah, show higher obesity rates due to lifestyle differences, including greater consumption of high-calorie foods and a more sedentary lifestyle. Historical data reflects a troubling upward trend in obesity rates, necessitating urgent public health interventions.

Key risk factors contributing to obesity in Saudi Arabia include dietary habits, with increased consumption of fast food and sugary beverages playing a significant role. Sedentary lifestyles, driven by urbanization and technological dependence, further exacerbate the problem. Socio-economic factors, such as limited access to healthy foods and opportunities for physical activity, also contribute to the rising obesity rates. Additionally, genetic predisposition appears to play a role, with certain genetic markers associated with higher obesity rates in the Saudi population. Public health challenges include cultural resistance to dietary changes, limited access to healthy food options, and gaps in health education and awareness.

To address the obesity epidemic in Saudi Arabia, several actionable recommendations are proposed for public health authorities. Community-based exercise programs should be developed to encourage physical activity among all age groups. These programs could include organized sports, fitness classes, and public awareness campaigns to promote regular exercise. Healthier school meal plans should be implemented to improve dietary habits among children and adolescents, ensuring that meals are balanced and nutritious. Additionally, subsidies for healthy foods, such as fruits and vegetables, should be considered to make these options more affordable and accessible to lower-income families. Stricter regulations on the marketing of unhealthy foods, particularly to children, can also help reduce consumption of high-calorie, low-nutrient products.

Future research should focus on evaluating the effectiveness of public health initiatives aimed at reducing obesity rates. Long-term studies could provide insights into which interventions are most successful in achieving sustainable changes in obesity prevalence. Additionally, further exploration of genetic factors related to obesity in the Saudi population could offer valuable information for personalized prevention and treatment strategies. Research could also investigate the impact of cultural and socio-economic factors on obesity rates, helping to develop more targeted and culturally appropriate interventions. Continued research in these areas will be crucial for developing effective strategies to combat obesity and improve public health outcomes in Saudi Arabia.

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